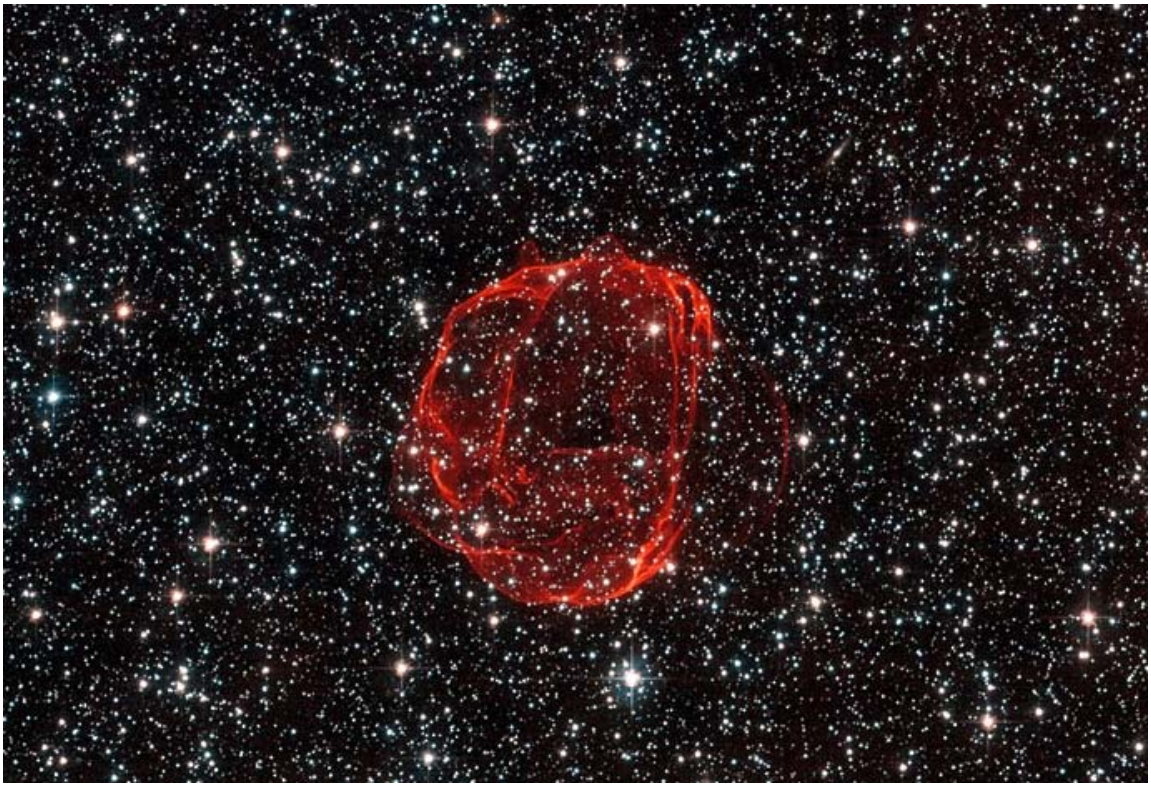

These delicate wisps of gas make up an object known as supernova remnant SNR 0519. The thin, blood-red shells are actually the remnants from when an unstable star exploded violently as a supernova around 600 years ago. SNR 0519 is located over 150,000 light-years from Earth in the southern constellation of Dorado, a constellation that also contains most of our neighboring galaxy, which is called the Large Magellanic Cloud. One light year equals about 10 trillion kilometers.

Problem 1 – The diameter of this supernova remnant shell is about 24 light years. The distance from our sun to the nearest star Alpha Centauri is 4.3 light years. If the sun were placed at the center of the supernova shell, about where would Alpha Centauri be at the same scale?

Problem 2 – The star that produced this shell exploded 600 years ago. If there are about 30 million seconds in one year, how fast was the shell traveling in kilometers/second expressed A) as a simplified fraction? B) As a decimal number?

http://www.nasa.gov/mission_pages/hubble/science/snr-0519.html

Hubble Sees the Remains of a Star Gone Supernova

May 3, 2013

Problem 1 – The diameter of this supernova remnant shell is about 24 light years. The distance from our sun to the nearest star Alpha Centauri is 4.3 light years. If the sun were placed at the center of the supernova shell, about where would Alpha Centauri be at the same scale?

Answer: **About 1/3 of the way from the center to the edge of the shell**.

Problem 2 – The star that produced this shell exploded 600 years ago. If there are about 30 million seconds in one year, how fast was the shell traveling in kilometers/second expressed A) as a simplified fraction? B) As a decimal number?

Answer: The center of the shell is 12 light years from the edge, so the distance traveled in 600 years is 12 x 10 trillion km, or 120 trillion kilometers.

Since 600 years equals 600x30 million seconds = 18 billion seconds,

the shell travels 120 trillion km / (18 billion seconds)
= 120,000 billion/18 billion
= 120,000/18

A) As a simplified fraction $\frac{20000}{3}$ **kilometers per second**

B) As a decimal: 120000/18 = **6,666 kilometers per second**.

This speed is about 100 times faster than the Space Station orbiting Earth.